EX-91089/91109/91129/91159/91179/91199
Display Monitor User Manual

Release Date	Revision
Aug. 2008	V1.0
Dec. 2009	V1.1

Warning!

This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

Electric Shock Hazard – Do not operate the machine with its back cover removed. There are dangerous high voltages inside.

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Chapter 1

1.1 Features

Model	EX-91089	EX-91109	EX-91129	EX-91159	EX-91179	EX-91199
Display	8” TFT LCD	10.4” TFT LCD	12.1” TFT LCD	15” TFT LCD	17” TFT LCD	19” TFT LCD
Luminance	400 cd/m2	250 cd/m2	400 cd/m2	350 cd/m2	300 cd/m2	300 cd/m2
Resistive touch screen (optional)						
Optional DVI, Video or S-Video input						
Supports wide-ranging resolutions from 640x480 to up to 1600 x 1200 with auto phase and auto position.						

1.2 Specifications

Display

Model	EX-91089	EX-91109	EX-91129	EX-91159	EX-91179	EX-91199
Luminance	400 cd/m²	250 cd/m²	400 cd/m²	350 cd/m²	300 cd/m²	300 cd/m²
Viewing Angle	H:130/V:120	H:130/V:110	H:130/V:110	H:140/V:125	H:140/V130	H:160/V:160
Resolution	800x600	800x600	800x600	1024x768	1280x1024	1280x1024
Backlight lifetime	40000hrs	20000hrs	50000hrs	50000hrs	50000hrs	50000hrs
Touch Screen	Resistive touch screen (optional)					
OSD Control Indicators	Automatic screen, setup (OSD), brightness, contrast, horizontal/vertical position, image lock, color balance, video information, power on and sync detected					
OS Compatibility	Win XP, 2000, NT 4.0, QNX, Linux					
Internal Power Adapter	Input: 12V/DC Optional Input 11~28V/DC					

Environment

Operating Temperature: 0~50˚C (32˚~122˚F)
Storage Temperature: -20~60˚C (-4˚~140˚F)
Relative Humidity: 10~90% @40˚C non-condensing, without touch screen
Vibration: 1g peak, 5~500Hz (at random)
Shock: 10G peak acceleration (11msec. duration)/operation
Certifications: Meet CE, FCC Class A

Mechanical

Model	EX-91089	EX-91109	EX-91129	EX-91159	EX-91179	EX-91199
Construction	Steel Chassis					
Dimensions	208X148mm	260x213mm	300x250mm	357x291mm	410x330mm	423x333mm
Mounting Type	Panel Mount					

Ordering Information

EX-91089	8” SVGA open frame display monitor
EX-91109	10.4” SVGA open frame display monitor
EX-91129	12.1” SVGA open frame display monitor
EX-91159	15” XGA open frame display monitor
EX-91179	17” SXGA open frame display monitor
EX-91199	19” SXGA open frame display monitor
Options	Resistive touch screen

1.3 Dimensions

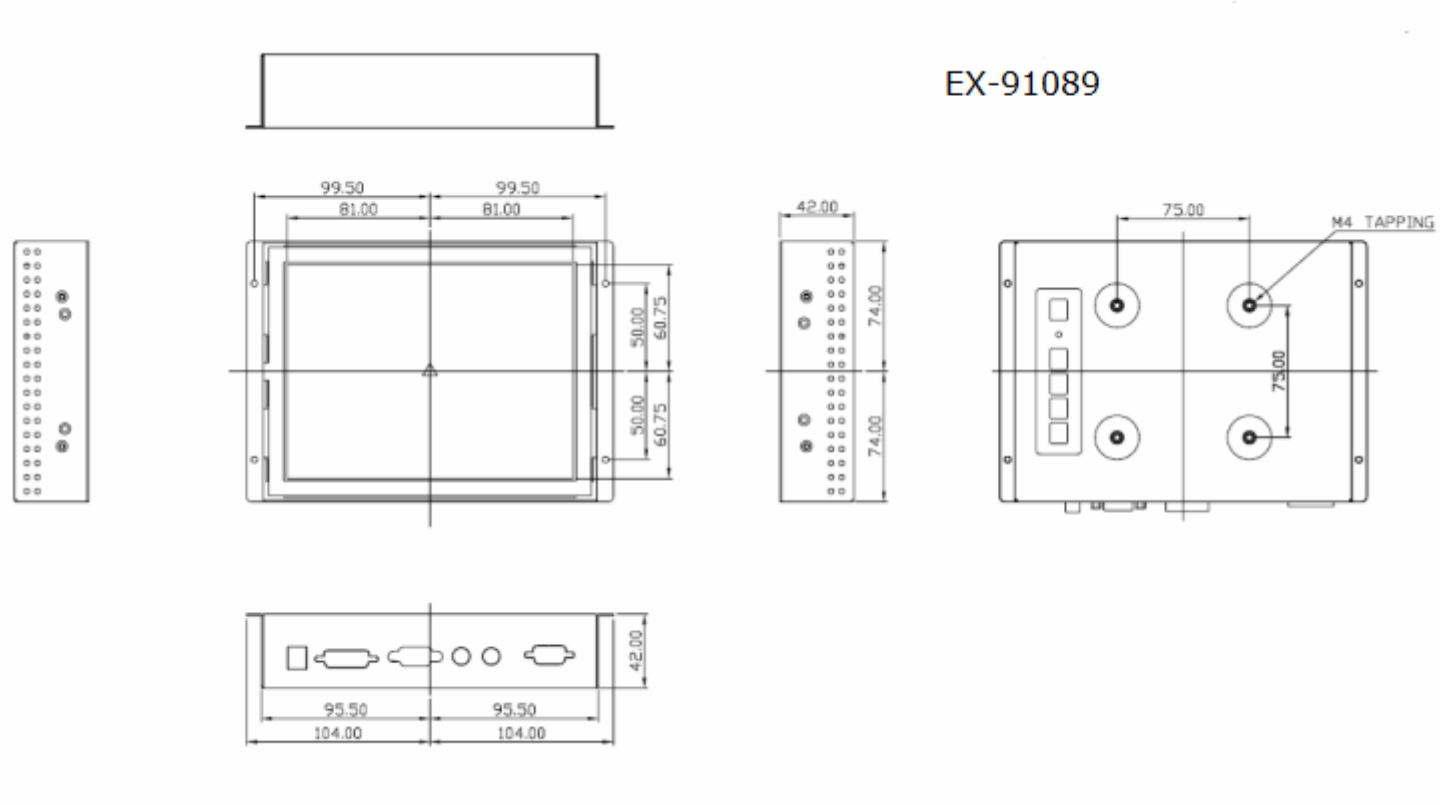


Figure 1.1: Dimensions of the EX-91089

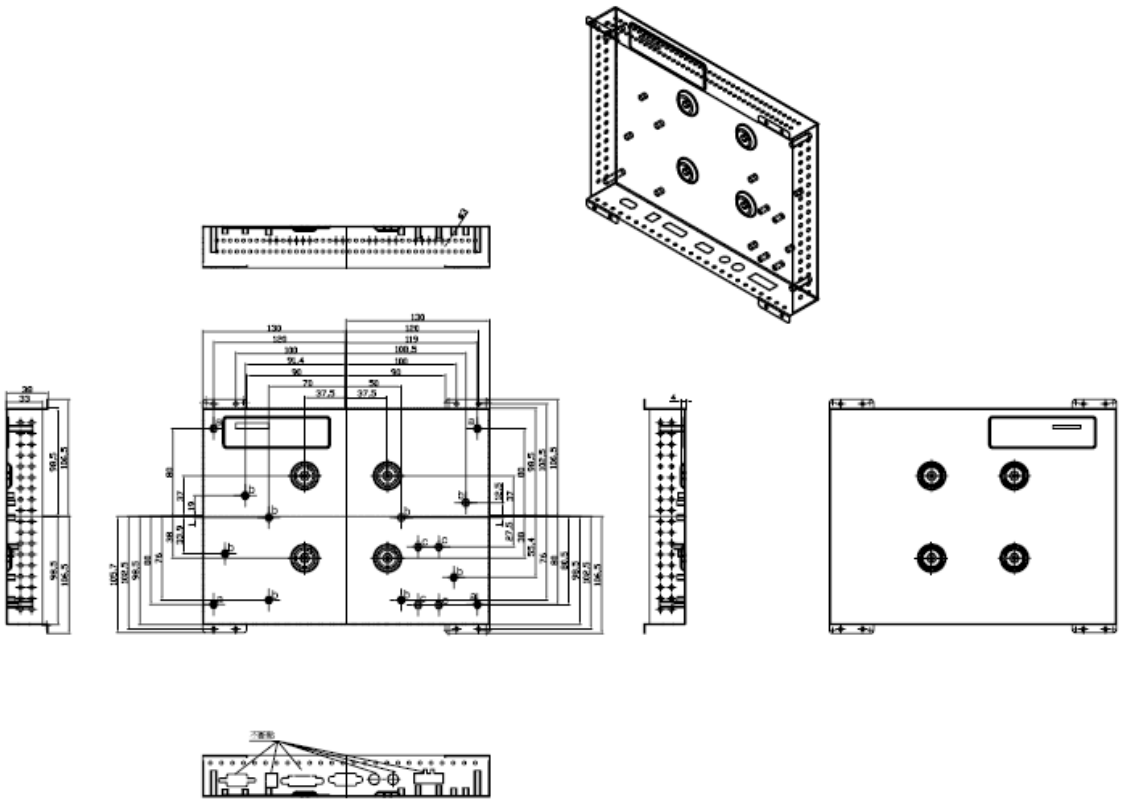


Figure 1.2: Dimensions of the EX-91109

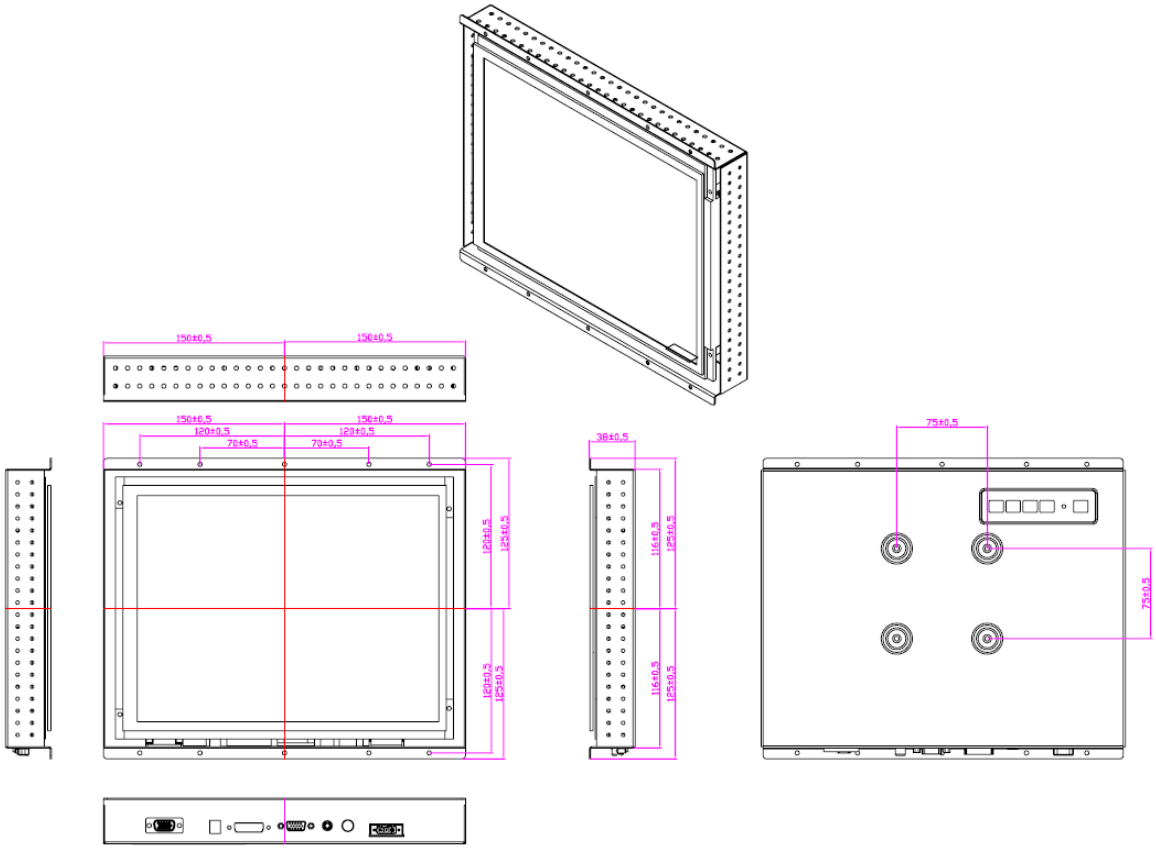


Figure 1.3: Dimensions of the EX-91129

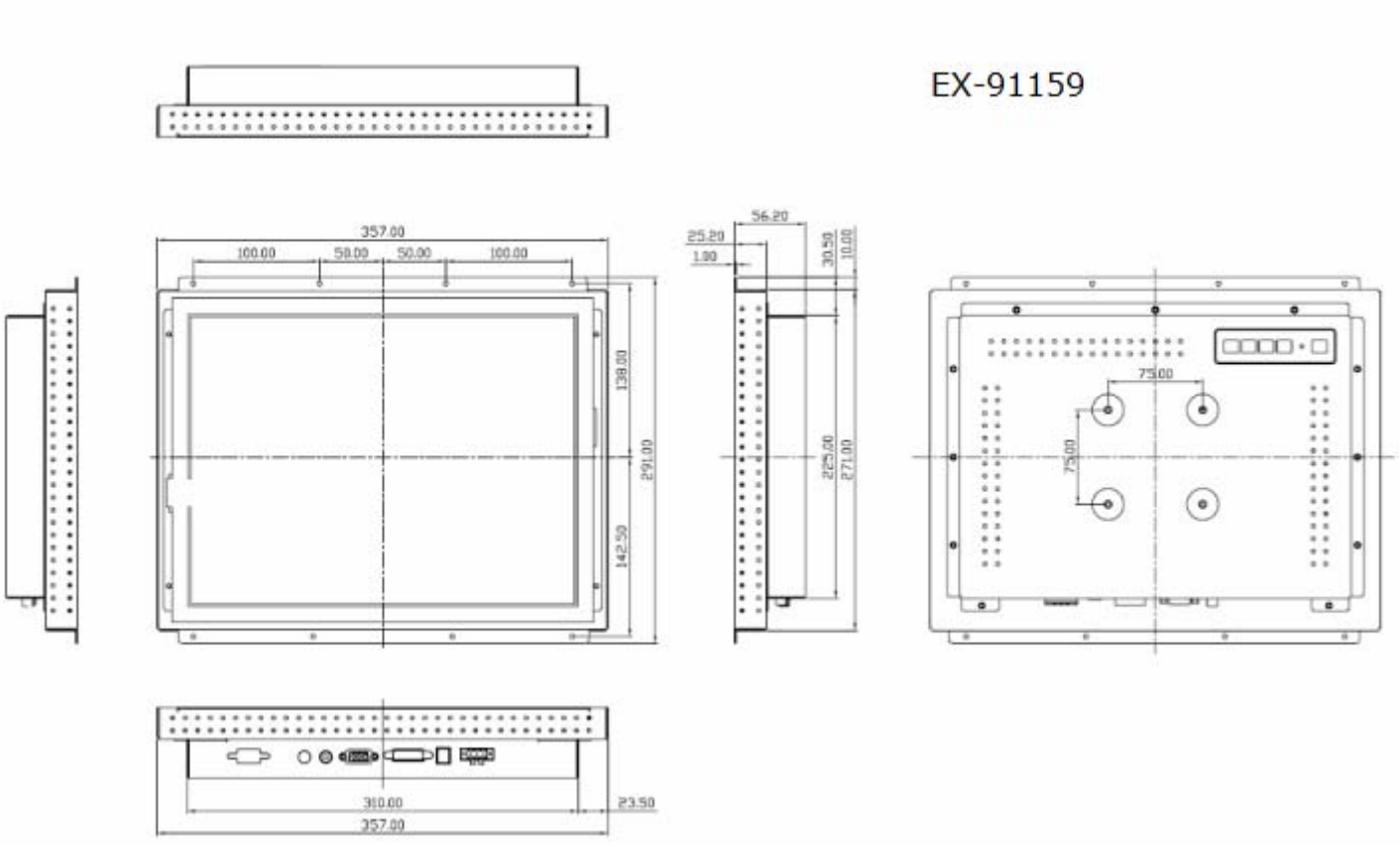


Figure 1.4: Dimensions of the EX-91159

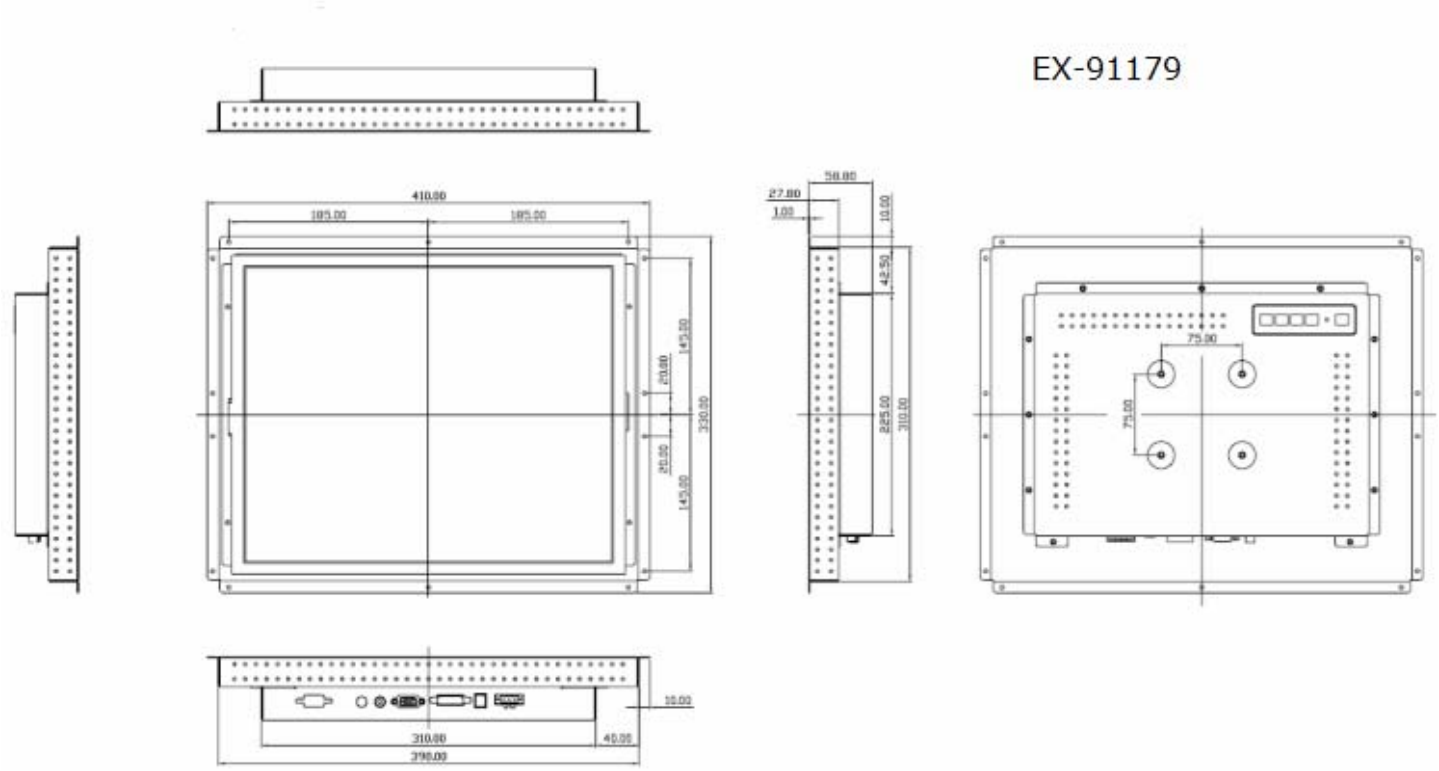


Figure 1.5: Dimensions of the EX-91179

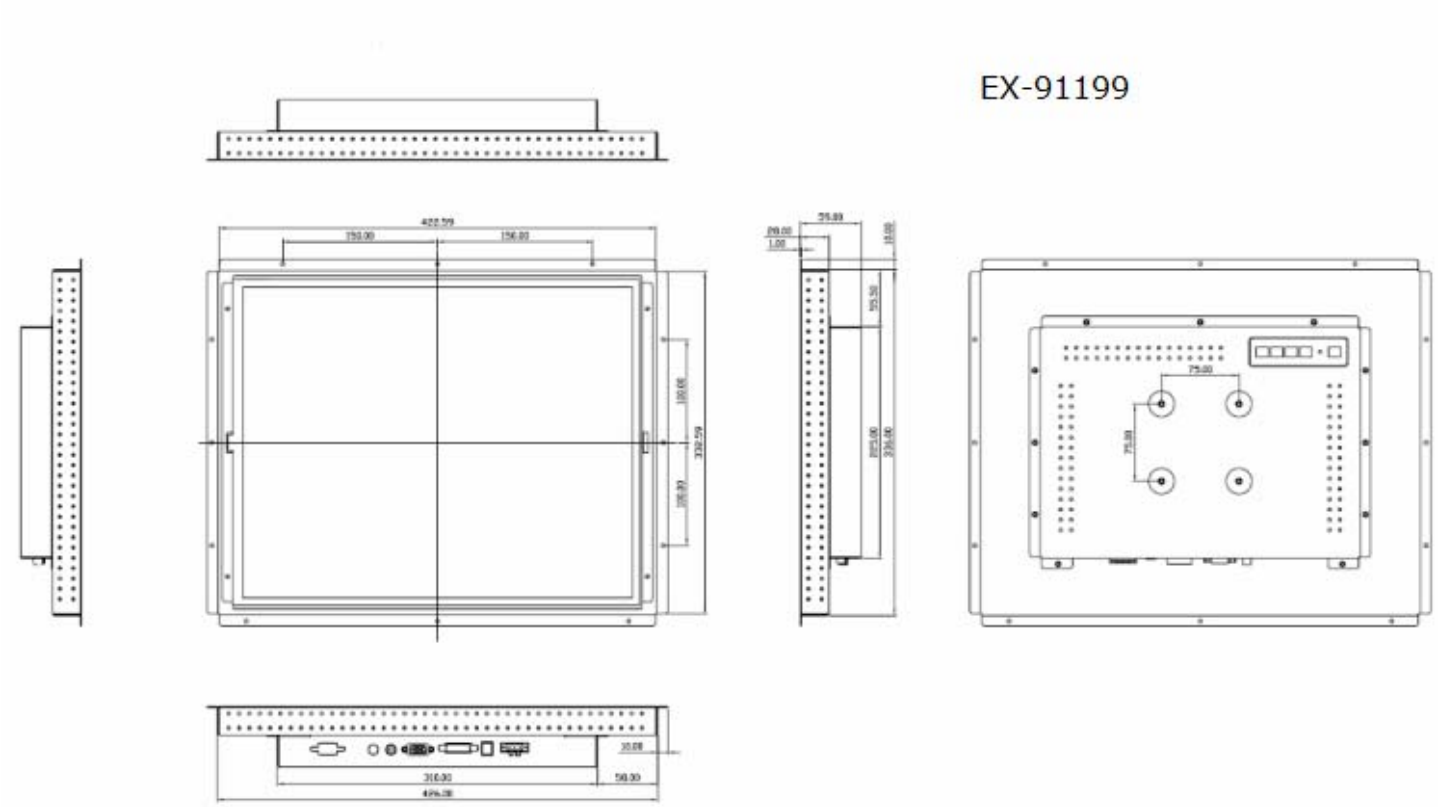


Figure 1.6: Dimensions of the EX-91199

1.4 Brief Description of the EX-91xx9

The EX-91xx9 offers 8” / 10.4”/12.1/15”/17”/19” LCD open frame display the feature an excellent viewing ability for special monitoring and control applications, especially in Industrial area. It is available with resistive touch screen that is easy to use and maintain.

Figure 1.7: Overall View of EX-91xx9

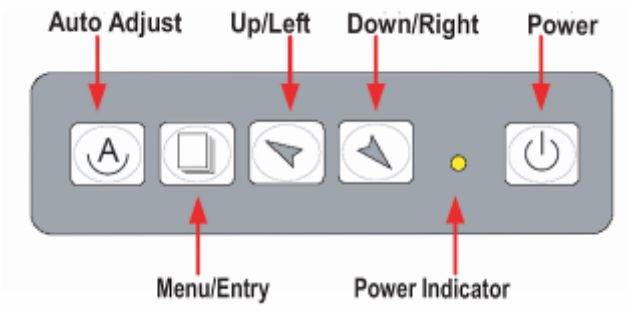
Figure 1.8: Rear View of EX-91xx9

1.5 Display Mode

Display Mode		Hori. Sync (KHz)	Vert. Sync. (Hz)
VGA 640 x 480		31	60
		38	72
		38	75
SVGA 800 x 600		35	56
		38	60
		48	72
		47	75
XGA 1024 x 768		48	60
		56	70
		60	75
SXGA	1152 x 864	68	75
	1280 x 1024	64	60
		80	75

Chapter 2

2.1 OSD Functions



Power switch: To turn ON or OFF the power

Shift the icon to the right side or shift it up

Shift the icon to the left side or shift it down

Menu: To enter OSD menu for related icon and item.

Auto Button: One-touch auto adjustment

1.) Getting into Burn-in Mode

Before setting into a burn-in mode, first disconnect the AC power cord. Then press (don't let them go) the buttons until the AC power cord is connected and the "RGB" appears on the top left corner of your screen. Now it can be put into the burn-in mode for changing colors.

2.) Getting Out of Burn-in Mode

Before getting out of the burn-in mode, please first disconnect the AC power cord. Then press the button (If not workable, press the button and don't let them go) until the AC power cord is connected. Please don't let your fingers go until the AC power cord is connected again and the wording of "RGB" appears on the top left corner of your screen, and wait for 3 second. Under the non-signal entry situation, if **Cable Not Connected** is seen, exit is thus successfully made.

2.2 OSD Controls

To make any adjustment, select the following:

1. Press (Menu) to show the OSD menu or disable the OSD menu.
2. Select the icon that you wish to adjust with the (/ or +/-) key in the menu.
3. Press (Menu) and then choose the item with the (/ or +/-) key.
4. Press (Menu) and then adjust the quality with the (/ or +/-) key.

1.) If the “RGB” is still on the top left corner of the screen, press to enter “Miscellaneous” and choose “Reset”, and then **Yes,** and press . When the screen goes black, disconnect power and repeat the above steps.

2.) If the “RGB” is not found, disconnect the AC power cord first. Then press the buttons (don’t let them go) until the AC power cord is connected, and wait for 2 to 3 seconds. When “RGB” appears, repeat the above steps.

3.) Functions of OSD Keys

2.3 Main Menu

In the **Main** menu, there are the following items:

- Color
- Image Setting
- Position
- OSD Menu
- Language
- Misc
- Exit

For **Color**, check out the following:

- Contrast
- Brightness
- Color Adjust
- Color Temp
- Back

For **Image setting**, check out the following:

- Clock
- Phase
- Gamma
- Sharpness
- Back

In the **Position**, there are the following:

- H. Position
- V. Position
- Back

In the **OSD** menu, there are:

- OSD H. Pos.
- OSD V. Pos.
- OSD Timer
- Back

In the **Language** menu, there are:

- English
- Frances
- Germany
- Spanish
- Traditional Chinese
- Simplified Chinese
- Japanese

In the **Misc** menu, there are:

- Signal Source
  Select VGA: Analogue VGA Input
  Select DVI: Digital DVI-D Input
  Select AV: Composite Video Input
  Select SV: S-Video Video Input
- Reset
- Back

Chapter 3

3.1 Introduction to the PenMount 9036 Controller Board

The PenMount 9036 control board is configured for use with the RS-232 interface. It connects to the touch screen, power supply and computer system's RS-232 port, and supports 4-, 5- and 8-wire touch screens. The control board has some advanced functions, such as PnP and non-PnP mode adjustable baud rate, thus making easy for customers to select different touch screens without changing the control board. The size of the board is 25 by 60mm, and it has two connectors and one dipswitch on-board.

Figure 3.1: Bird's Eye View of PenMount 9036

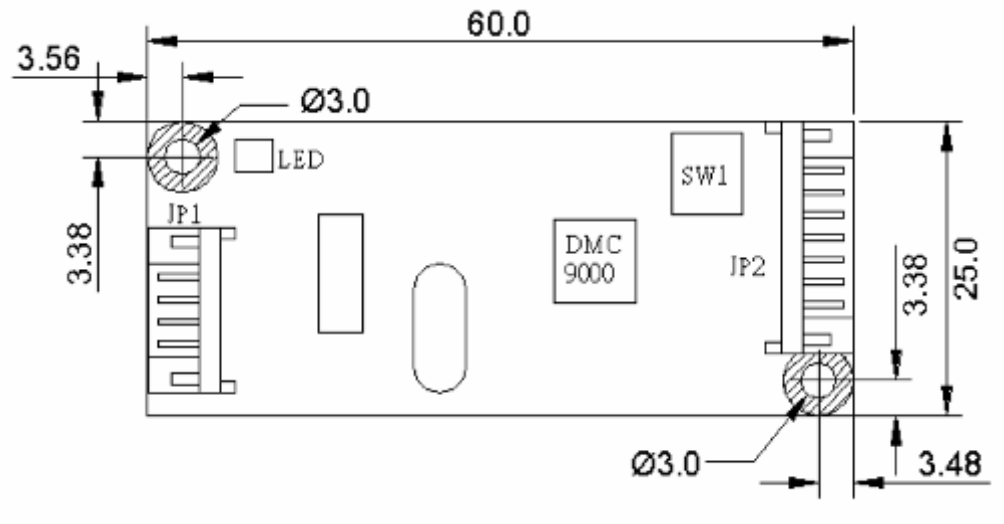


Figure 3.2: Mechanical Drawing of PenMount 9036

3.2 Features

- RS-232 interface
- Touch controller is DMC9000
- Design for the best touch performance and easy configuration
- PnP or Non-PnP mode selectable
- Design for best cost arrangement
- Supporting 2048x2048 pen device resolution
- 19200 or 9600 baud rate transmission selectable
- Upgraded noise handling mechanism (3 level scheme)
- Fixed and high-speed sampling rate
- 4-, 5- and 8-wire touch screen supported
- Touch screen cable, RS-232 with power cable connectors onboard
- 5V to 12V power input
- Circuit protection for input voltage
- Touch-activated LED indicator onboard

3.3 Electrical Specifications

Touch Screen:
4-, 5- and 8-wire analog resistive type

Touch Screen Controller:
DMC9000

Communications:
RS-232

Baud Rate:
19200 and 9600 baud rate selection

Resolution:
1024x1024 (10-bit A/D converter inside)

Power Input:
5V ~ 12V DC

Power Consumption:
12V: 24mA+ i where (i=v/touch screen sheet R)
5V: 20mA+ i where (i=v/touch screen sheet R)

Board Size:
6.0 x 2.5cm

Portrait:
Support 90 ° to 279 ° screen rotation

Static Protection:
ESD device (optional)

3.4 Installation of the 9036 Controller Board

Follow the steps below to install the 9036 control board:

1. Power down your computer and display, and open your display or system case. Find space on your system and attach the control board to your system with screws. The control board has industry standard 3ϕ screw holes.
2. Find the white 6-pin right-angle connector (on the left in the image above [see Figure 3.1]). The power cable is pin 1 and pin 2. Solder the power and ground wire to the system. The RS-232 cable is for pins 3 to 6. Attach the RS-232 cable's D-sub connector to a COM port at the back of the computer.
3. Find the white 9-pin right-angle connector (on the right in the image above [see Figure 3.1]). Attach the female end of the touch screen cable to this connector. If you attach the cable of a 4-/5-/8-wire touch screen to pins 1~5/1~6/1~9, attach the male end of the cable to the touch screen tail.
4. Mount your touch screen to the display.
5. Find the onboard DIP switch (on the upper right of the image above [see Figure 3.1]). This switch selects baud rate, PnP or non-PnP mode, and touch screen type. Set the DIP switch to configure your control board according to the definitions and settings of the table below:

Switch	Definition	ON	OFF
S1	Baud Rate Adjustment	9600	19200
S2	PnP enable or disable	Disable	Enable
S3	Touch screen type	5-wire	4-, 8-wire
S4	Touch screen type	4-, 8-wire	5-wire

6. Turn on power to the computer and the display.
7. Install the software drivers and utilities and calibrate the touch screen.

Chapter 4

4.1 Windows 2000 / XP Driver Installation for 9036 Controller Board

Before installing the Windows 2000/XP driver software, you must have the Windows 2000/XP system installed and running on your computer. You must also have the 9036 PenMount Serial Interface controller board installed. Contents of the PenMount Windows 2000/XP driver folder are listed below:

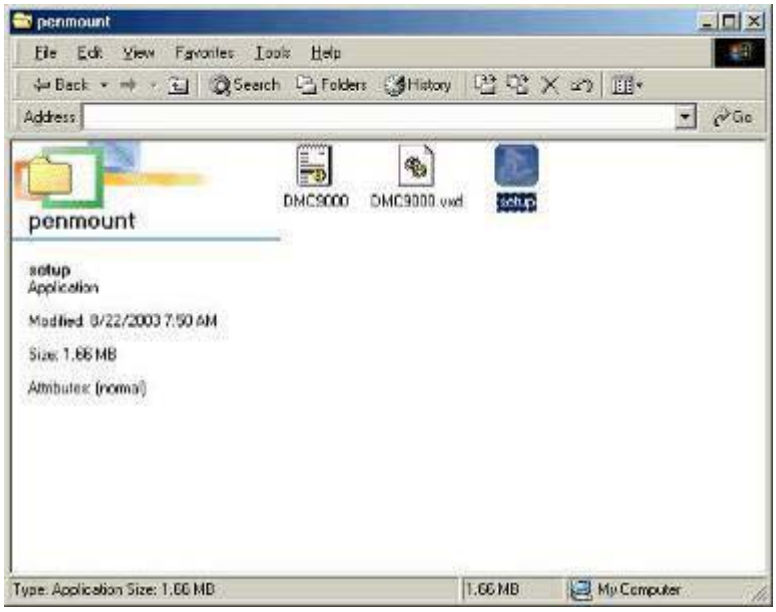
SETUP.EXE
DMC9000.INF
DMC9000.VXD

If you have an older version of the PenMount Windows 2000/XP driver installed in your system, please remove it first. Follow the steps below to install the PenMount Windows 2000/XP driver.

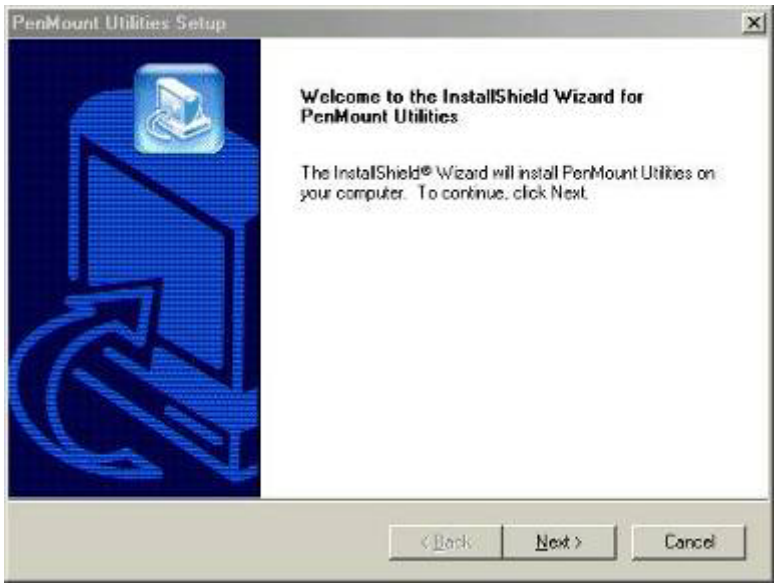
1. When the system first detects the controller board, a screen appears that shows "Unknown Device." Do not use this hardware wizard. Press Cancel.

Add New Hardware Wizard
Windows has found the following new hardware:
Unknown Device
Windows can automatically search for and install software that supports your hardware. If your hardware came with installation media, insert it now and click Next.
What would you like to do?
Automatic search for a better driver (Recommended)
Specify the location of the driver (Advanced)
< Back
Next >
Cancel

2. Install the PenMount Windows 2000/XP driver onto your system from the CD-ROM:



3. A welcome message for the PenMount utilities setup program appears. Select “Next”.

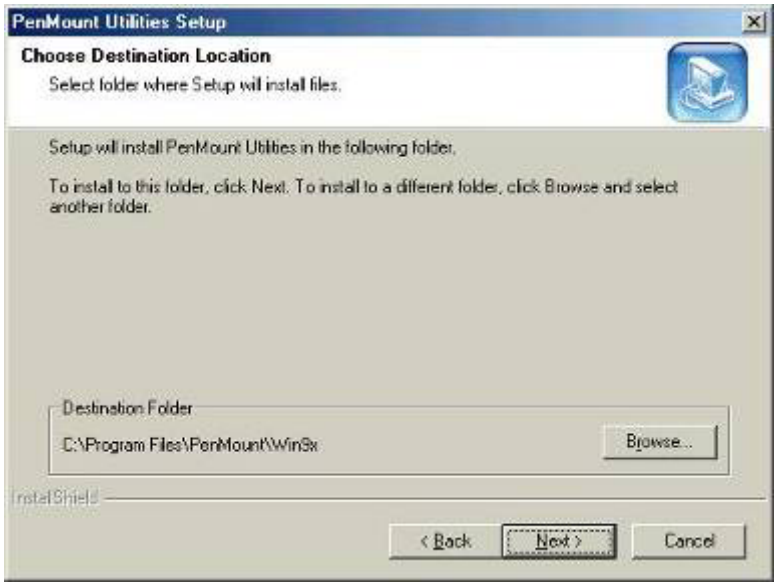

PenMount Utilities Setup
Welcome to the InstallShield Wizard for PenMount Utilities
The InstallShield® Wizard will install PenMount Utilities on your computer. To continue, click Next.
< Back
Next >
Cancel

4. The Software License Agreement screen appears. Select "Yes".

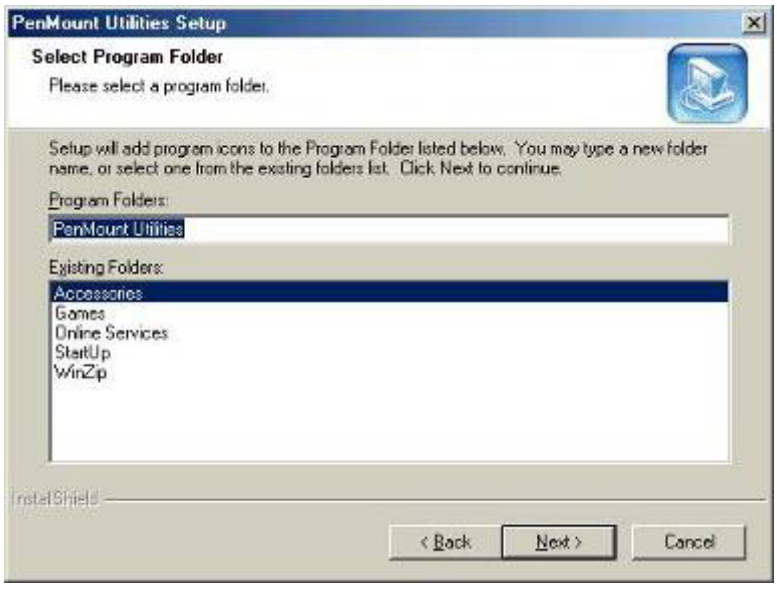
PenMount Utilities Setup
License Agreement
Please read the following license agreement carefully.
Press the PAGE DOWN key to see the rest of the agreement.
Software License
Copyright C. Salt International Corp. All right reserved.
PenMount Utilities drivers include DOS, Windows 3.11,
Windows 95, Windows 98, Windows ME, Windows NT,
Windows 2000, Windows XP, Windows CE, Linux and Qnx drivers.
To copy, modify, or translate is prohibited except with Salt's written consents.
To license PenMount Utilities drivers, contact Salt International Corp.
Email: salt@salt.com.tw
Do you accept all the terms of the preceding License Agreement? If you choose No, the setup will close. To install PenMount Utilities, you must accept this agreement.
InstallShield
< Back
Yes
No

5. The Information screen appears. Select "Next".

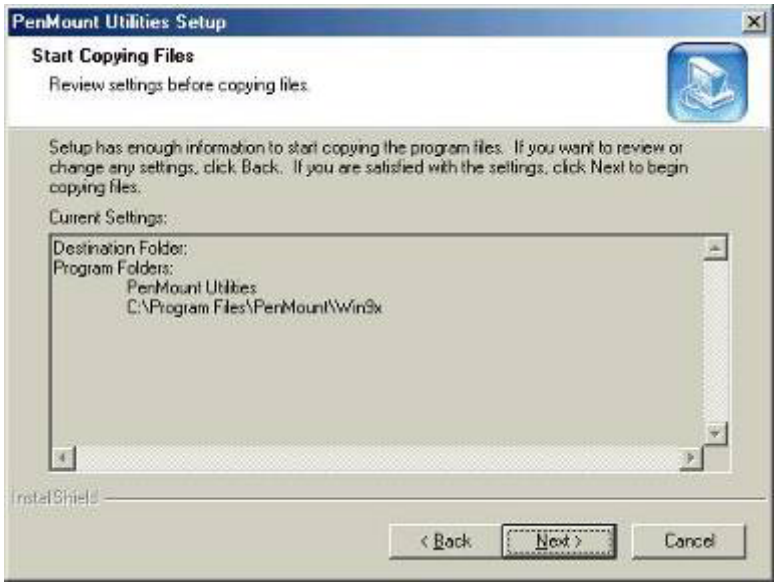
6. The Choose Destination Location screen appears. This installs PenMount Utilities in the folder: C:\Program Files\PenMount\Win9x. Select "Next" or modify the folder name to the one you would like to use.


PenMount Utilities Setup
Choose Destination Location
Select folder where Setup will install files.
Setup will install PenMount Utilities in the following folder.
To install to this folder, click Next. To install to a different folder, click Browse and select another folder.
Destination Folder
C:\Program Files\PenMount\Win9x
Browse...
InstallShield
< Back
Next >
Cancel

7. The Select Program Folder screen appears. The default is "PenMount Utilities". Select "Next" or change it.



8. The Start Copying Files screen appears. Select "Next" to copy files to the system.


PenMount Utilities Setup
Start Copying Files
Review settings before copying files.
Setup has enough information to start copying the program files. If you want to review or change any settings, click Back. If you are satisfied with the settings, click Next to begin copying files.
Current Settings:
Destination Folder:
Program Folders:
PenMount Utilities
C:\Program Files\PenMount\Win9x
InstallShield
< Back
Next >
Cancel

9. The Setup Complete screen appears. Select "Finish".

PenMount Utilities Setup
InstallShield Wizard Complete
Setup has finished installing PenMount Utilities on your computer.
CAUTION: If there is any trouble, reboot your PC first after installing!
< Back
Finish
Cancel

10. The “Restarting Windows” screen appears, choose “Yes, I want to restart my computer now,” and “OK.”

Restarting Windows
Setup has finished copying files to your computer. Before you can use the program, you must restart your computer.
Choose one of the following options and click OK to finish setup.
Yes, I want to restart my computer now.
No, I will restart my computer later.
OK

Configuring the PenMount Windows 2000/XP Driver

Upon restarting, the computer automatically finds the new 9000 controller board. The touch screen is connected but not calibrated. Follow the procedures below to carry out calibration.

1. After installation, click the PenMount Monitor icon “PM” in the menu bar.
2. When the PenMount Control Panel appears, click “Calibrate.”

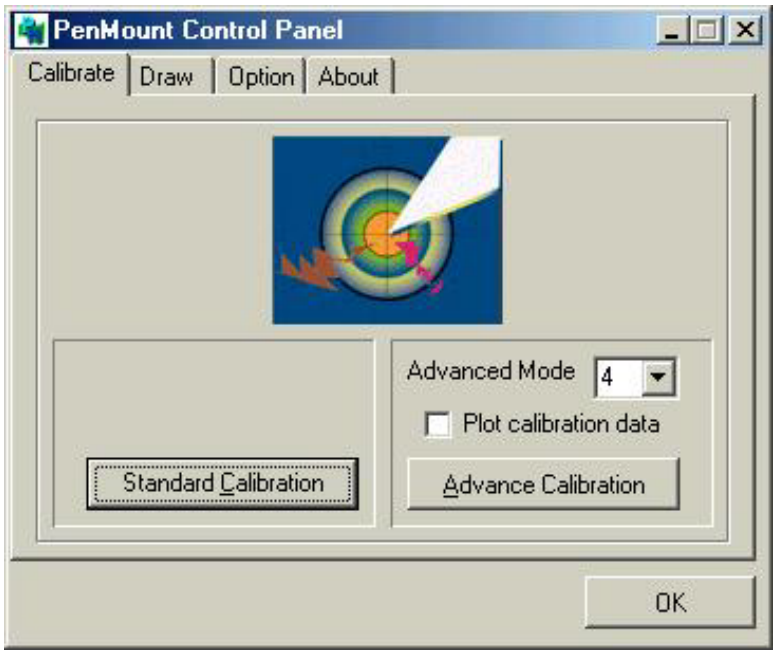
PenMount Control Panel

The functions of the PenMount Control Panel are explained in the following sections.

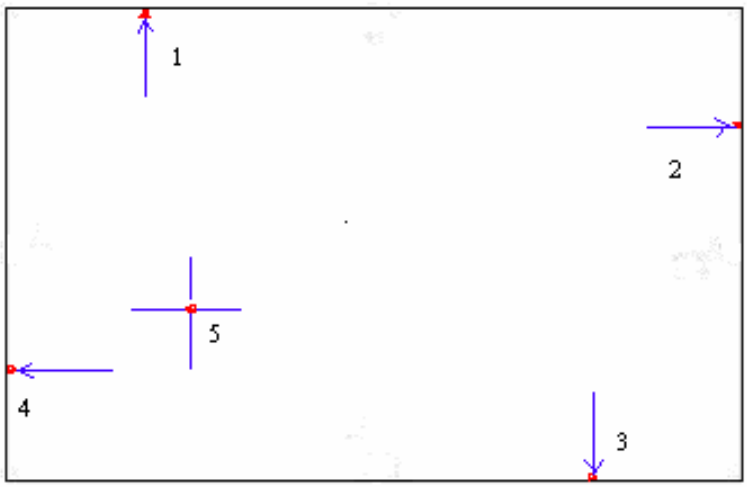
Calibrate

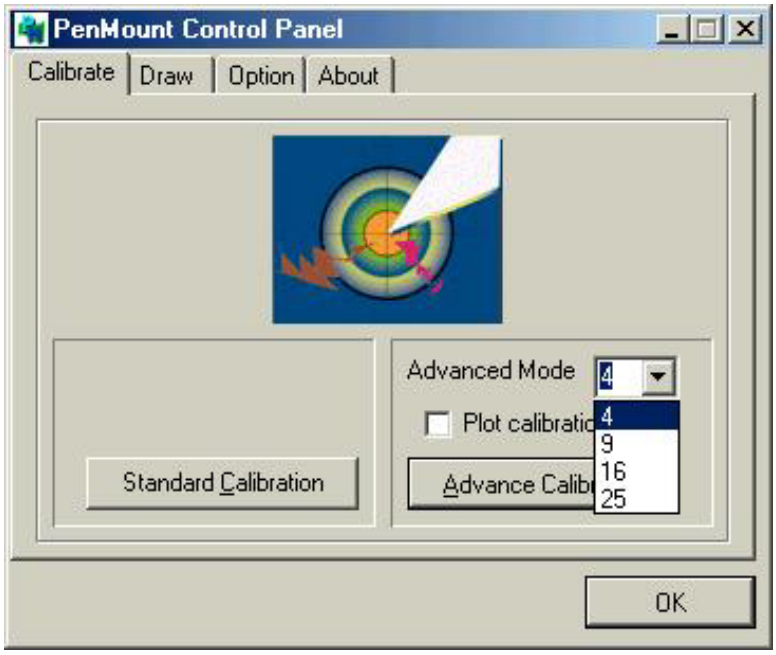
This function offers two ways to calibrate your touch screen. ‘Standard Calibration’ adjusts most touch screens. ‘Advanced Calibration’ adjusts aging touch screens.

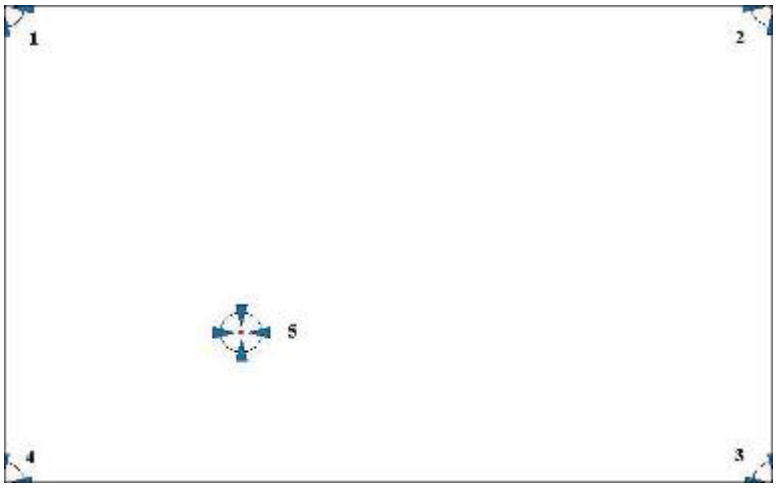
Standard Calibration	**Click this button and arrows appear pointing to red squares. Use your finger or stylus to touch the red squares in sequence. After the fifth red point calibration is complete. To skip, press ‘ESC’.**
Advanced Calibration	**Advanced Calibration uses 4, 9, 16 or 25 points to effectively calibrate touch panel linearity of aged touch screens. Click this button and touch the red squares in sequence with a stylus. To skip, press ESC’.**



- **NOTE:** The older the touch screen is, the more Advanced Mode calibration points you need for an accurate calibration. Use a stylus during Advanced Calibration for greater accuracy.



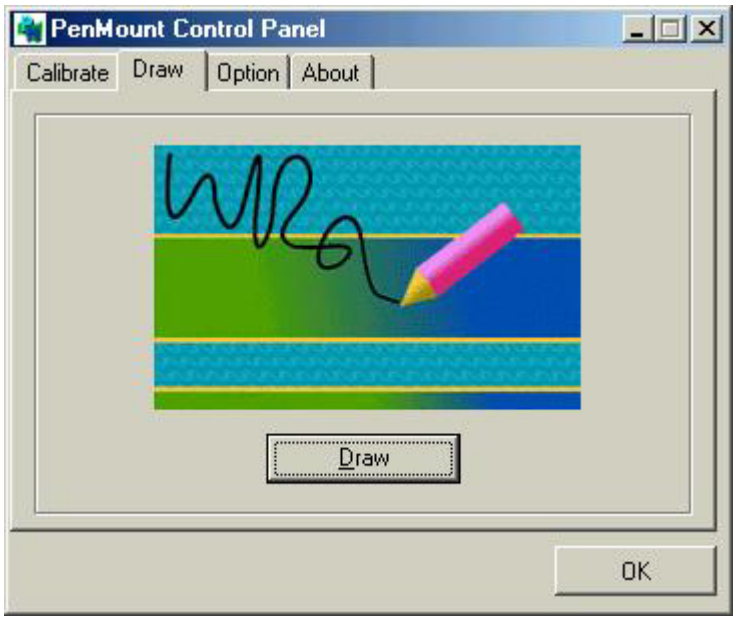




Plot Calibration Data **Check this function and a touch panel linearity comparison graph appears when you have finished Advanced Calibration. The blue lines show linearity before calibration and black lines show linearity after calibration.**

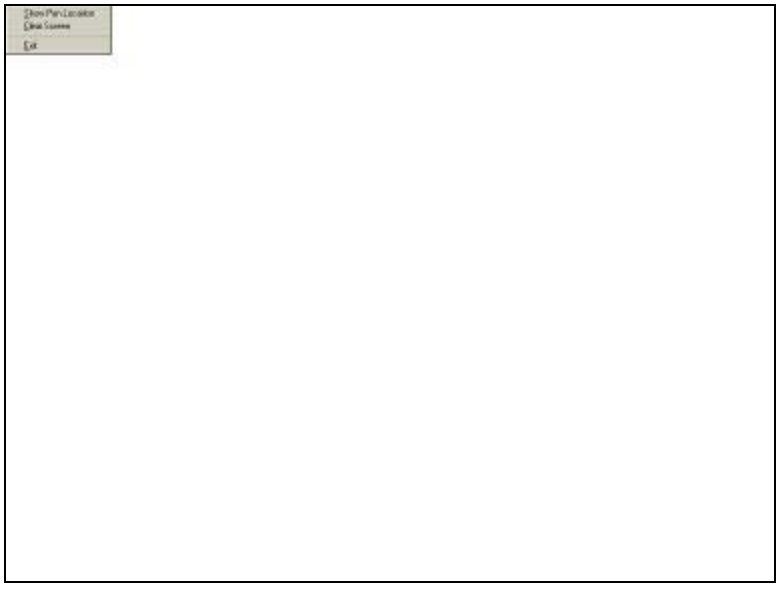
Draw

Tests or demonstrates the PenMount touch screen operation. The display shows touch location. Click **Draw** to start.



Touch the screen with your finger or a stylus and the drawing screen will register touch activity such as **left**, **right**, **up**, **down**, **pen up**, and **pen down**.

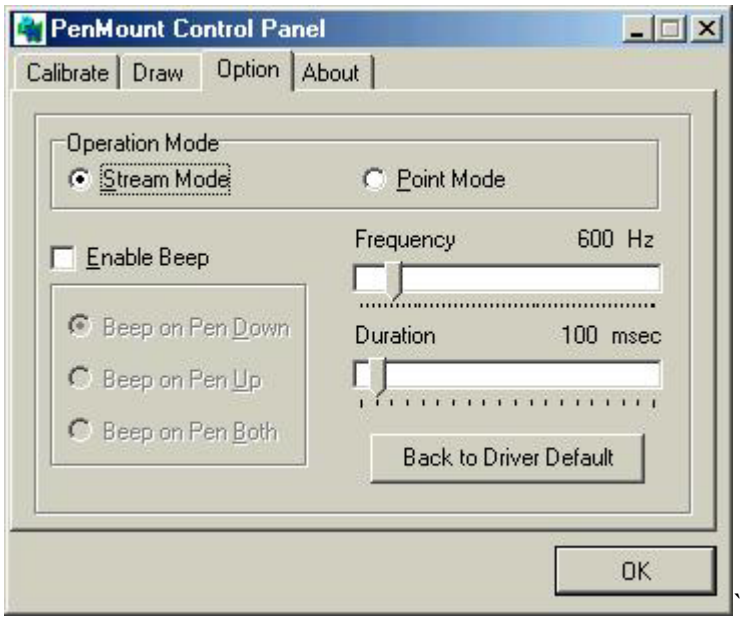
Click Clear Screen to clear the drawing.



Option

This panel function supports two modes—Operation Mode and Beep Sound Mode—which allow configuration for specific touch screen applications, such as point-of-sales (POS) terminals.

Operation Mode	**This mode enables and disables the mouse's ability to drag on-screen icons—useful for configuring POS terminals.** ***Stream Mode* – Select this mode and the mouse functions as normal and allows dragging of icons.** ***Point Mode* – Select this mode and the mouse only provides a click function, and dragging is disabled.**
Beep Sound Mode	***Enable Beep Sound* – turns beep function on and off** ***Beep on Pen Down* – beep occurs when pen comes down** ***Beep on Pen Up* – beep occurs when pen is lifted up** ***Beep on both of Pen Down/Up* – beep occurs on both** ***Beep Frequency* – modifies sound frequency** ***Beep Duration* – modifies sound duration**



About

This panel displays information about the PenMount controller and this driver version.

PenMount Monitor Menu Icon

The PenMount monitor icon (PM) appears in the menu bar of Windows 2000/XP system when you turn on the PenMount Monitor in the PenMount Utilities.

The PenMount Monitor has the following functions:

Right Click Button	**When you select this function, a mouse icon appears in the right-bottom of the screen. Click this icon to switch between Right and Left Button functions.**
Beep Sound	**Turns beep on or off.**
Enable PNP	**Turns PNP on or off. When this is unchecked, PNP is off. The RS-232 transfer signal is continuous when the cable is unplugged and plugged into the serial port.**
Exit	**Exits the PenMount Monitor function.**

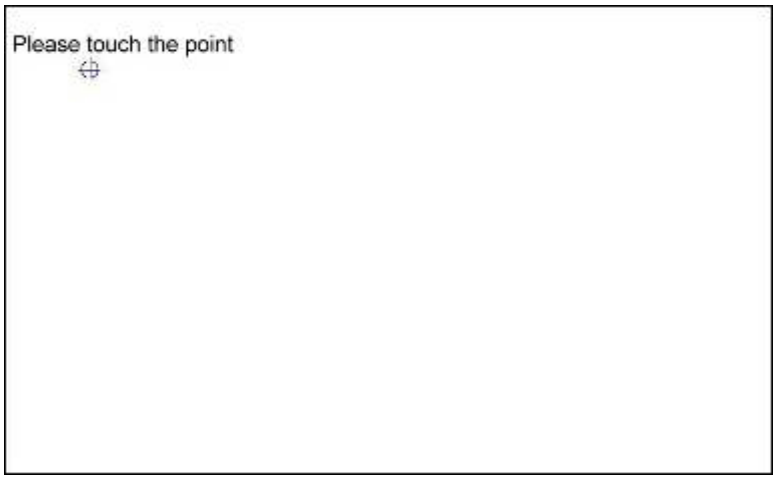
PenMount Rotating Functions

The PenMount driver for Windows 2000/XP supports several display rotating software packages. The PenMount drivers for Windows 2000/XP, as well as Windows 2000/XP support display rotating software packages such as:

- Portrait's Pivot Screen Rotation Software
- ATI Display Driver Rotate Function
- nVidia Display Driver Rotate Function
- SMI Display Driver Rotate Function
- Intel 845G/GE Display Driver Rotate Function

Configuring the Rotation Function

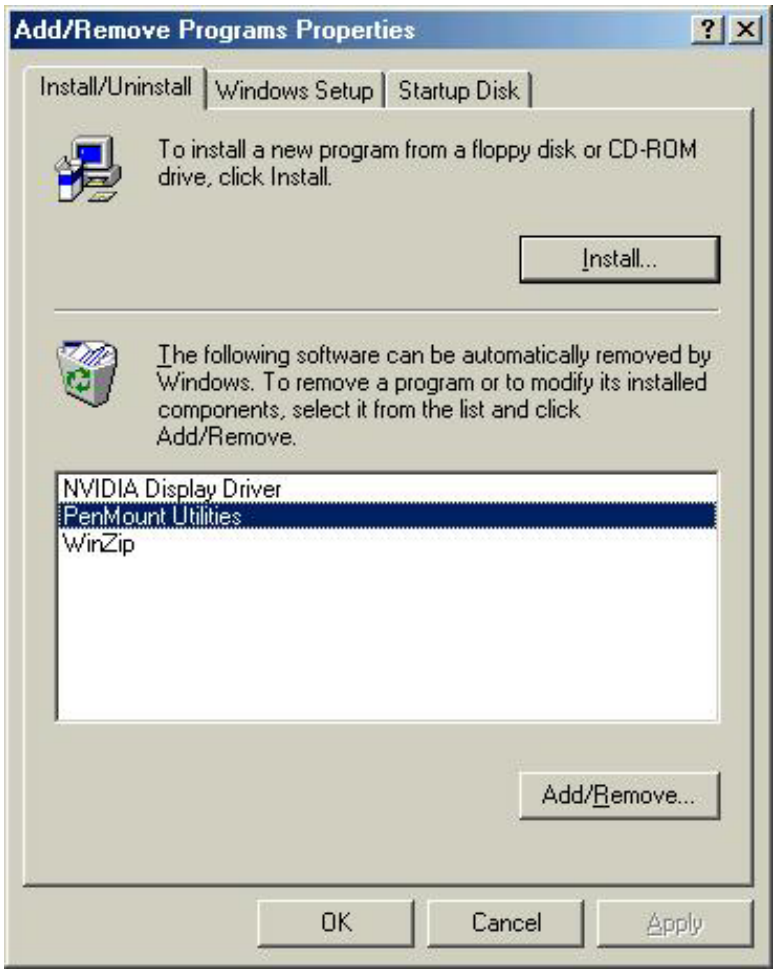
1. Install the rotation software package.
2. Choose the rotating function (0°, 90°, 180°, 270°) in the 3rd party software. The calibration screen appears automatically. Touch this point and rotation is mapped.



NOTE: The Rotating function is disabled if you use Monitor Mapping

4.2 Uninstall the PenMount Windows 2000/XP Driver

1. Exit the PenMount monitor (PM) in the menu bar.


Add/Remove Programs Properties
Install/Uninstall
Windows Setup
Startup Disk
To install a new program from a floppy disk or CD-ROM drive, click Install.
Install...
The following software can be automatically removed by Windows. To remove a program or to modify its installed components, select it from the list and click Add/Remove.
NVIDIA Display Driver
PenMount Utilities
WinZip
Add/Remove...
OK
Cancel
Apply

2. From “PenMount Utilities” in “Programs”, select the “Uninstall” utility
3. This message appears: “Are you sure you want to completely remove ‘PenMount Utilities’ and all its components?”
4. Select “Yes” to remove the PenMount Windows 2000/XP driver.
5. Reboot system and the PenMount Windows 2000/XP driver is removed from system.

4.3 Windows 2000/XP Driver Installation for 9036 Control Board

Before installing the Windows 2000/XP driver software, you must have the Windows 2000/XP system installed and running on your computer. You must also have the 9036 PenMount Serial Interface controller board installed. Contents of the PenMount Windows 2000/XP driver folder are listed below:

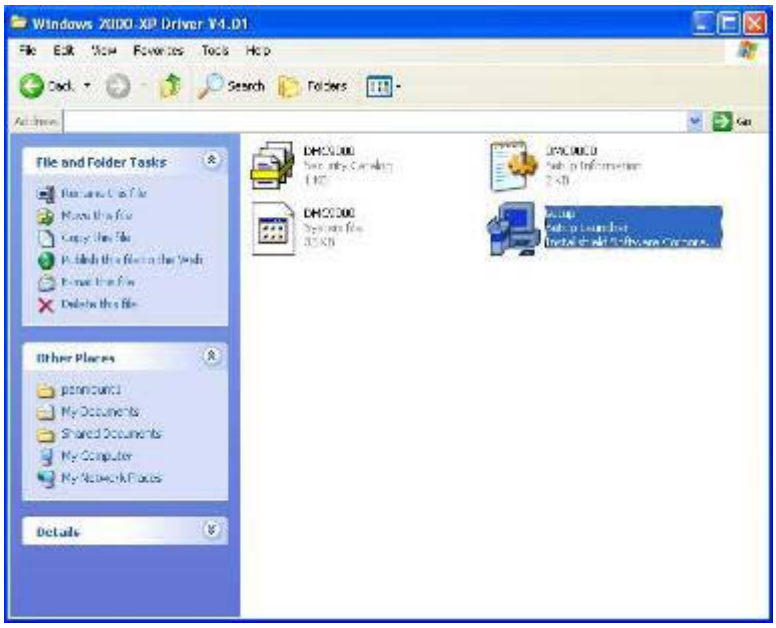
DMC9000.inf
DMC9000.sys
DMC9000.cat
SETUP.EXE

If you have an older version of the PenMount Windows 2000/XP driver installed in your system, please remove it first. Follow the steps below to install the PenMount Windows 2000/XP driver.

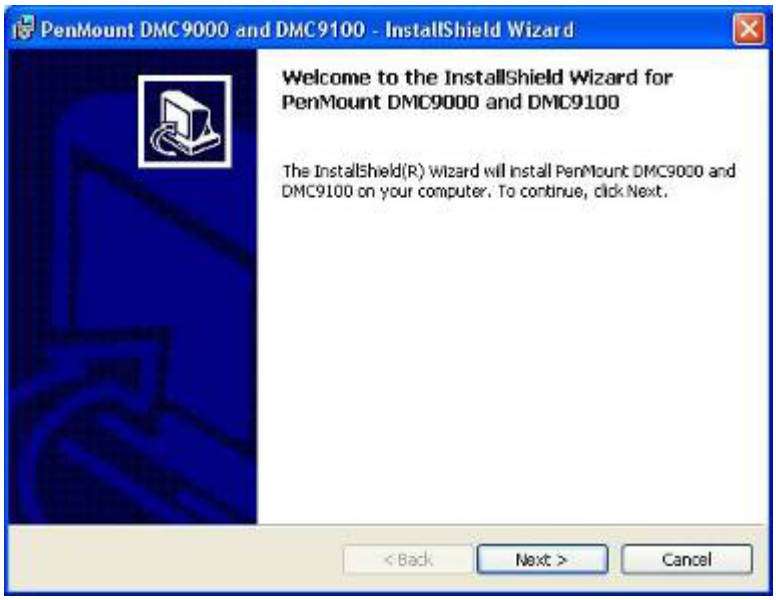
1. When the system first detects the controller board, a screen appears that shows “Unknown Device”. Do not use this hardware wizard. Press Cancel.

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
This wizard helps you install software for:
Unknown
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

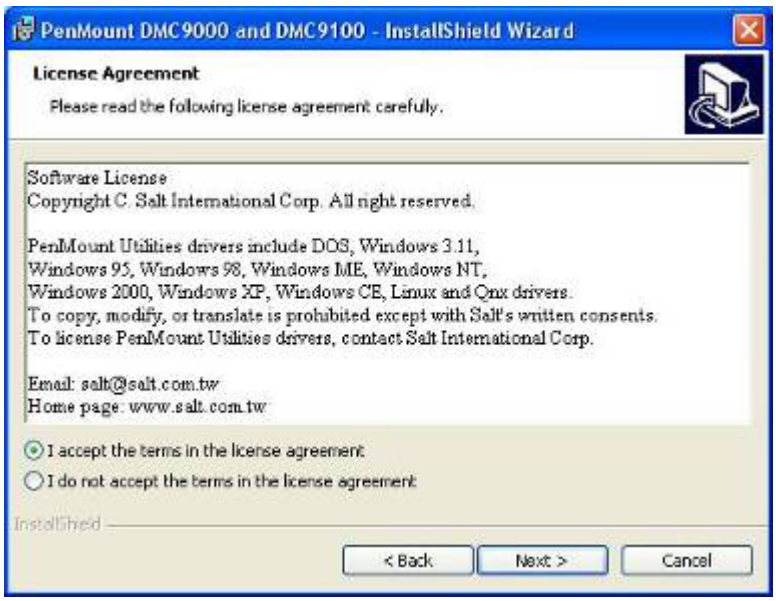
2. Insert the PenMount Driver CD-ROM. Go to the Windows 2000-XP Driver folder. Click **setup.exe**.



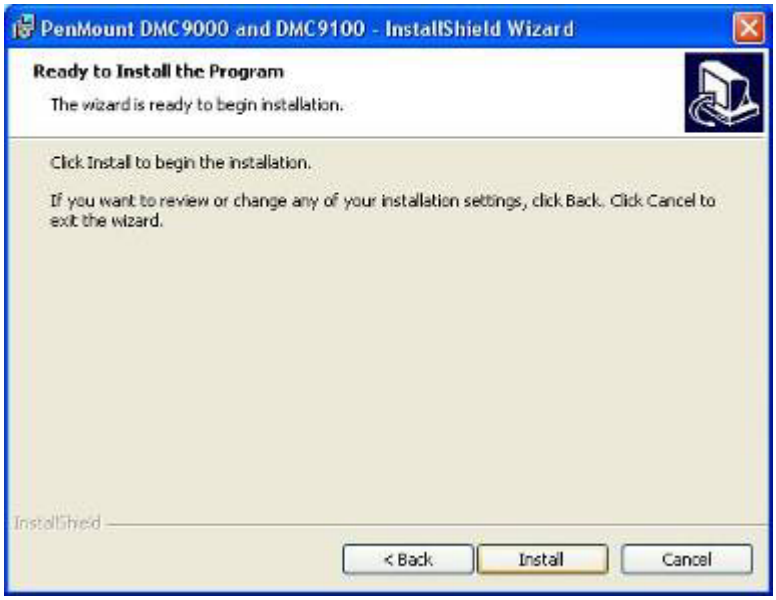
3. The screen displays the installation wizard for the PenMount software. Click “Next”.


PenMount DMC9000 and DMC9100 - InstallShield Wizard
Welcome to the InstallShield Wizard for PenMount DMC9000 and DMC9100
The InstallShield(R) Wizard will install PenMount DMC9000 and DMC9100 on your computer. To continue, click Next.
< Back
Next >
Cancel

3. A License Agreement appears. Click “I accept…” and “Next”.


PenMount DMC9000 and DMC9100 - InstallShield Wizard
License Agreement
Please read the following license agreement carefully.
Software License
Copyright C Salt International Corp. All right reserved.
PenMount Utilities drivers include DOS, Windows 3.11,
Windows 95, Windows 98, Windows ME, Windows NT,
Windows 2000, Windows XP, Windows CE, Linux and Qnx drivers.
To copy, modify, or translate is prohibited except with Salt's written consents.
To license PenMount Utilities drivers, contact Salt International Corp.
Email: salt@salt.com.tw
Home page: www.salt.com.tw
I accept the terms in the license agreement
I do not accept the terms in the license agreement
InstallShield
< Back
Next >
Cancel

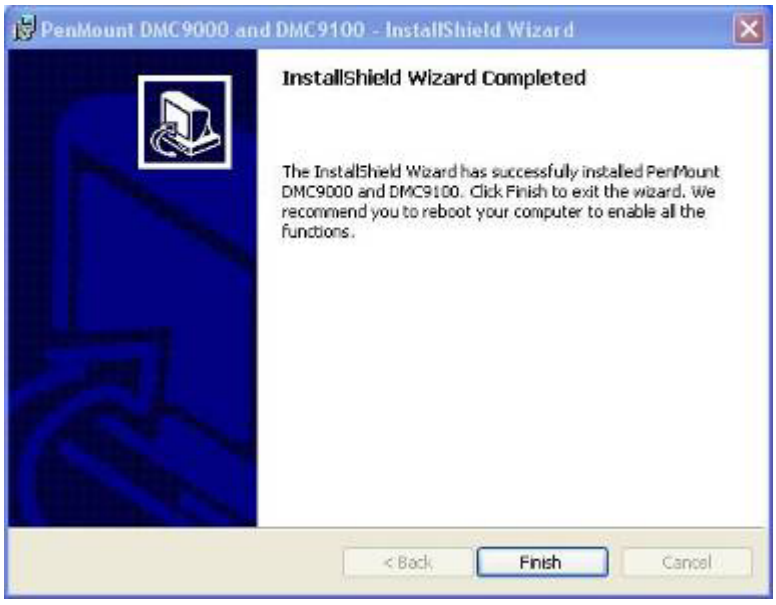
4. The “Ready to Install the Program” screen appears. Select “Install”.


PenMount DMC9000 and DMC9100 - InstallShield Wizard
Ready to Install the Program
The wizard is ready to begin installation.
Click Install to begin the installation.
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
InstallShield
< Back
Install
Cancel

5. The next screen is “Hardware Installation”. Select “Continue Anyway”.

Hardware Installation
The software you are installing for this hardware:
PenMount DMC9000 and DMC9100
has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)
Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.
Continue Anyway
STOP Installation

6. The “InstallShield Wizard Completed” appears. Click “Finish”.


PenMount DMC9000 and DMC9100 - InstallShield Wizard
InstallShield Wizard Completed
The InstallShield Wizard has successfully installed PenMount DMC9000 and DMC9100. Click Finish to exit the wizard. We recommend you to reboot your computer to enable all the functions.
< Back
Finish
Cancel

4.4 Configuring the PenMount Windows 2000/XP Driver

Upon rebooting, the computer automatically finds the new 9036 controller board. The touch screen is connected but not calibrated. Follow the procedures below to carry out calibration.

1. After installation, click the PenMount Monitor icon “PM” in the menu bar.
2. When the PenMount Control Panel appears, click “Calibrate”.

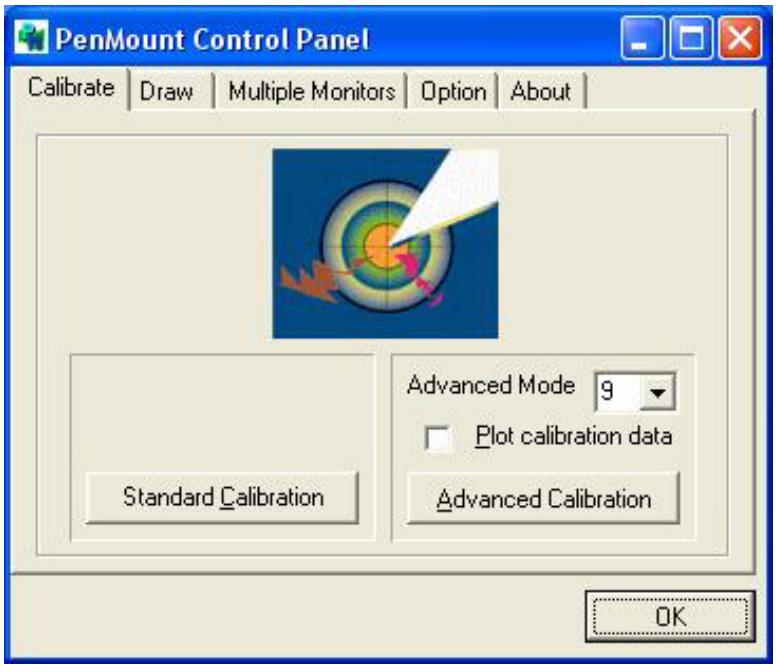
PenMount Control Panel

The functions of the PenMount Control Panel are **Calibrate**, **Draw**, **Multiple Monitors**, **Option**, and **About**, which are explained in the following sections.

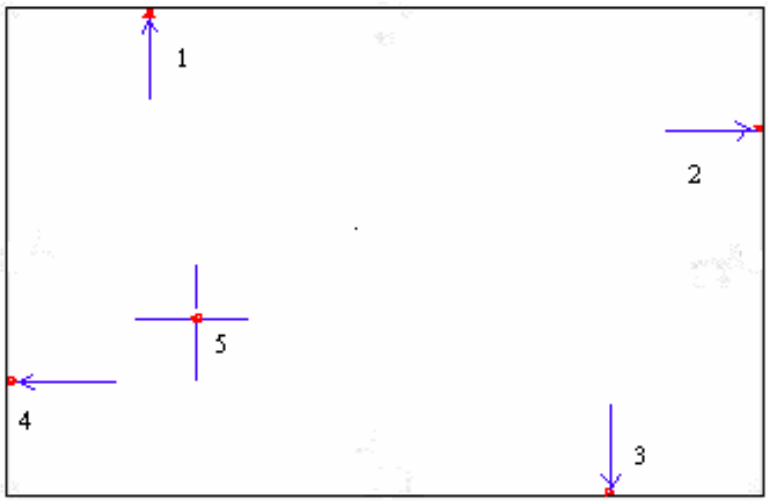
Calibrate

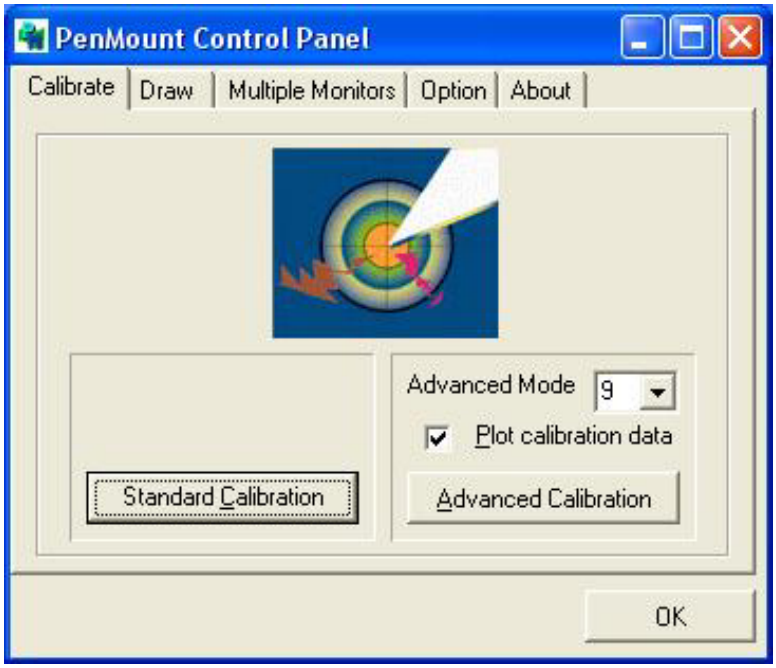
This function offers two ways to calibrate your touch screen. “Standard Calibration” adjusts most touch screens. “Advanced Calibration” adjusts aging touch screens.

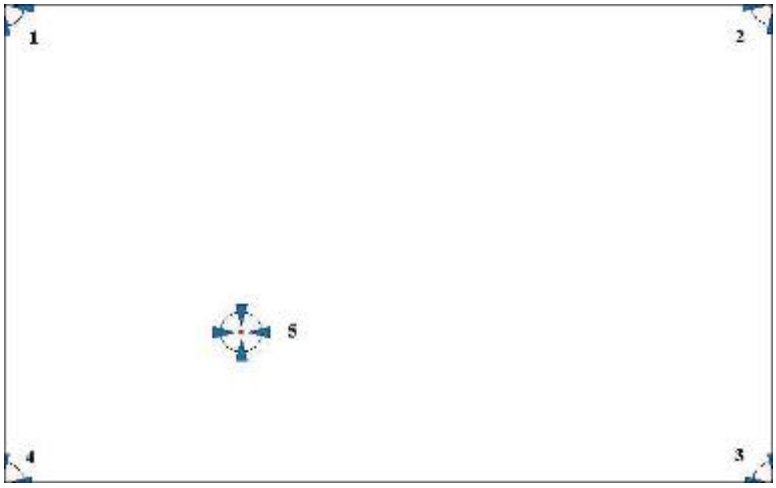
Standard Calibration	**Click this button and arrows appear pointing to red squares. Use your finger or stylus to touch the red squares in sequence. After the fifth red point calibration is complete. To skip, press ‘ESC’.**
Advanced Calibration	**Advanced Calibration uses 4, 9, 16 or 25 points to effectively calibrate touch panel linearity of aged touch screens. Click this button and touch the red squares in sequence with a stylus. To skip, press ‘ESC’.**



- **NOTE:** The older the touch screen is, the more Advanced Mode calibration points you need for an accurate calibration. Use a stylus during Advanced Calibration for greater accuracy.



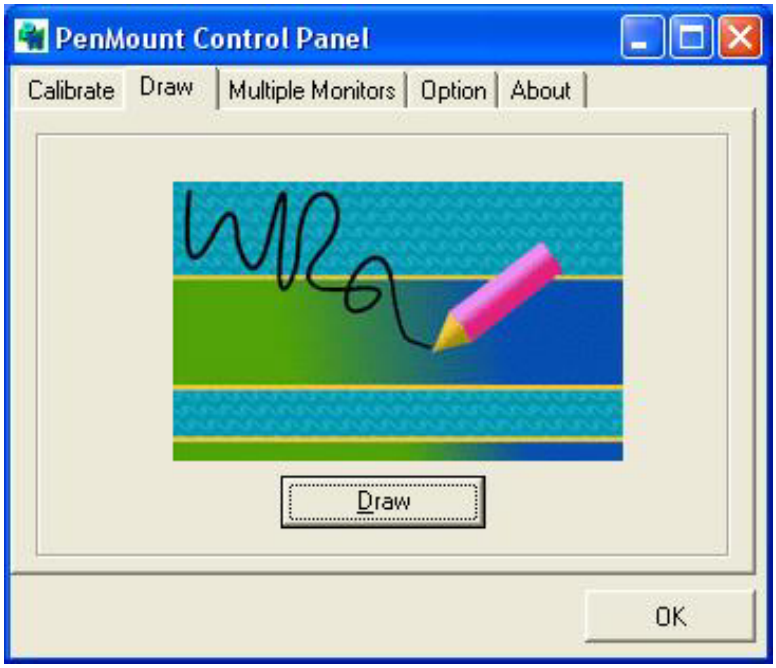




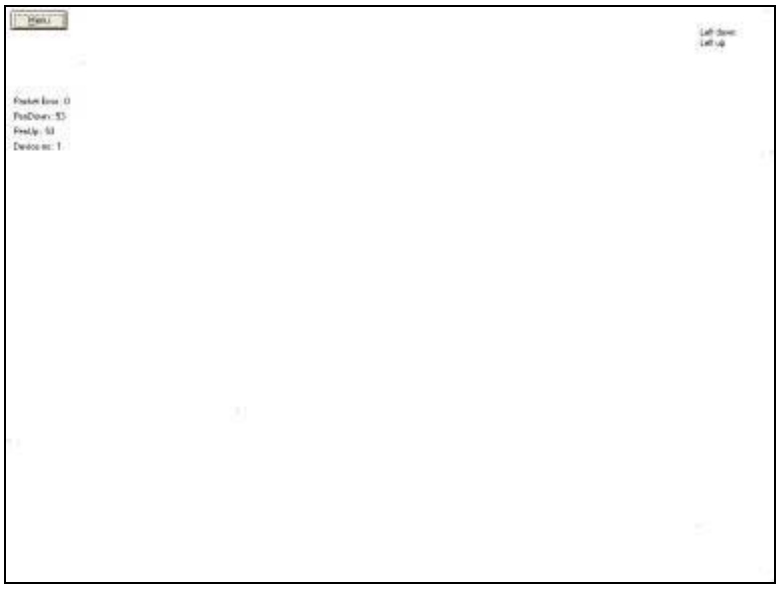
Plot Calibration Data **Check this function and a touch panel linearity comparison graph appears when you have finished Advanced Calibration. The blue lines show linearity before calibration and black lines show linearity after calibration.**

Draw

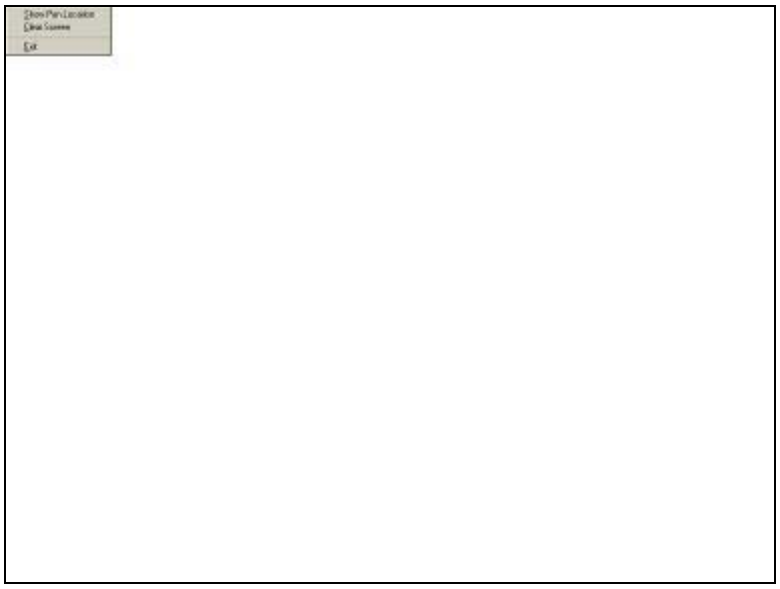
Tests or demonstrates the PenMount touch screen operation. The display shows touch location. Click **Draw** to start. Touch the screen with your finger or a stylus and the drawing screen will register touch activity such as **left**, **right**, **up**, **down**, **pen up**, and **pen down**.



Touch the screen with your finger or a stylus and the drawing screen will register touch activity such as **left**, **right**, **up**, **down**, **pen up**, and **pen down**.



Click Clear Screen to clear the drawing.



Multiple Monitors

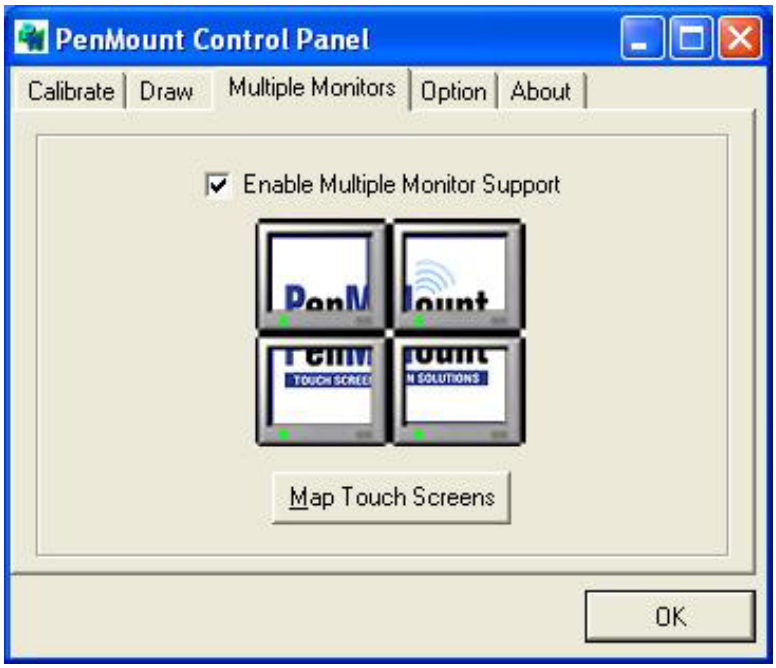
Multiple Monitors support from two to six touch screen displays for one system.
The PenMount drivers for Windows 2000/XP support Multiple Monitors. This function supports from two to six touch screen displays for one system. Each monitor requires its own PenMount touch screen control board, either installed inside the display or in a central unit. The PenMount control boards must be connected to the computer COM ports via the RS-232 interface. Driver installation procedures are the same as for a single monitor. Multiple Monitors support the following modes:

Windows Extends Monitor Function
Matrox DualHead Multi-Screen Function
nVidia nView Function

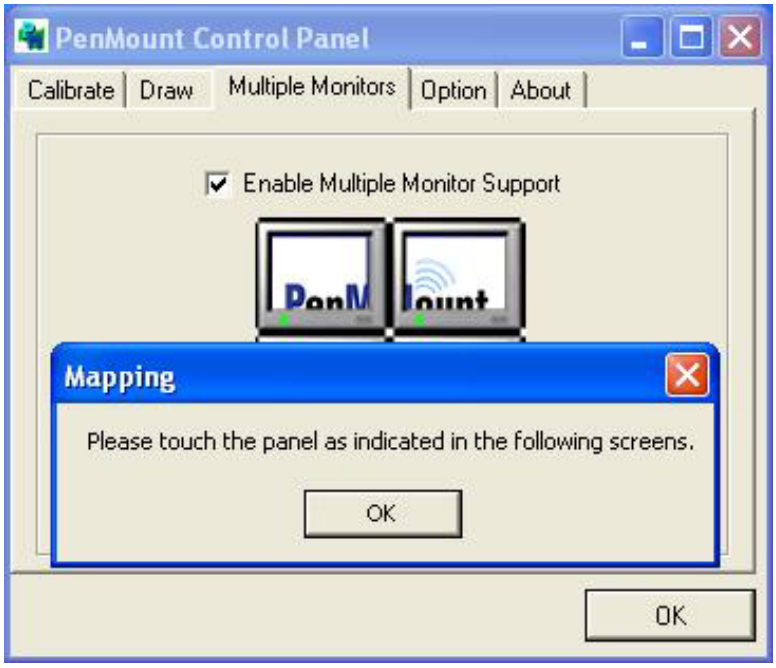
- **NOTE:** The Multiple Monitor function is for use with multiple displays only. Do not use this function if you have only one touch screen display. Please note once you turn on this function the rotating function is disabled.

Enable the multiple display function as follows:

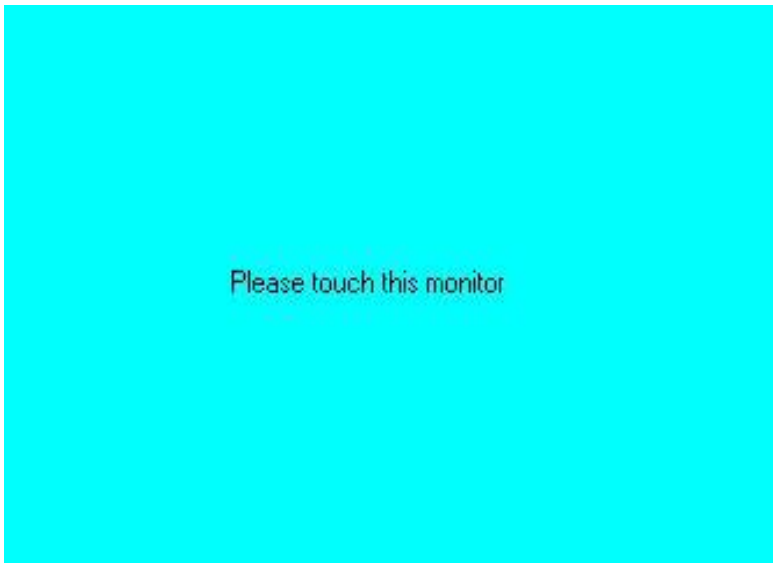
1. Check the **Enable Multiple Monitor Support** box; then click **Map Touch Screens** to assign touch controllers to displays.



2. When the mapping screen message appears, click OK.



3. Touch each screen as it displays “Please touch this monitor”. Following this sequence and touching each screen is called **mapping the touch screens**.



4. Touching all screens completes the mapping and the desktop reappears on the monitors.
5. Select a display and execute the “Calibration” function. A message to start calibration appears. Click OK.

6. “Touch this screen to start its calibration” appears on one of the screens. Touch the screen.
7. “Touch the red square” messages appear. Touch the red squares in sequence.
8. Continue calibration for each monitor by clicking **Standard Calibration** and touching the red squares.

- **NOTES:** 1. If you use a single VGA output for multiple monitors, please do not use the **Multiple Monitor** function. Just follow the regular procedure for calibration on each of your desktop monitors.

  - 2. The Rotating function is disabled if you use the Multiple Monitor function.

  - 3. If you change the resolution of display or screen address, you have to redo **Map Touch Screens,** so the system understands where the displays are.

About

This panel displays information about the PenMount controller and this driver version.

PenMount Monitor Menu Icon

The PenMount monitor icon (PM) appears in the menu bar of Windows 2000/XP system when you turn on the PenMount Monitor in the PenMount Utilities.

The PenMount Monitor has the following functions:

Beep	**Turns beep on or off.**
Right Button	**When you select this function, a mouse icon appears in the right-bottom of the screen. Click this icon to switch between Right and Left Button functions.**
Pen Stabilizer	**Check this function to reduce cursor vibration for relatively unstable touch screens, or where there may be excess vibration. Normally this function is not checked.**
Exit	**Exits the PenMount Monitor function.**

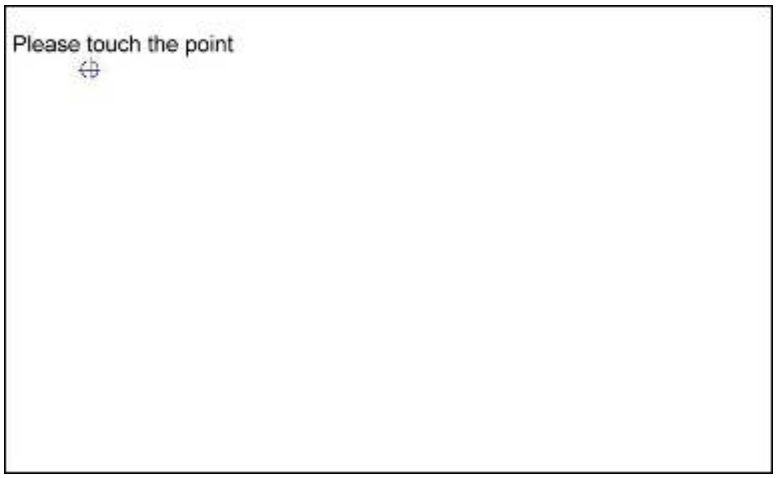
PenMount Rotation Functions

The PenMount driver for Windows 2000/XP supports several display rotating software packages. The PenMount drivers for Windows 2000/XP, as well as Windows Me/2000/XP support display rotating software packages such as:

- Portrait's Pivot Screen Rotation Software
- ATI Display Driver Rotating Function
- nVidia Display Driver Rotating Function
- SMI Display Driver Rotating Function
- Intel 845G/GE Display Driver Rotating Function

Configuring the Rotation Function

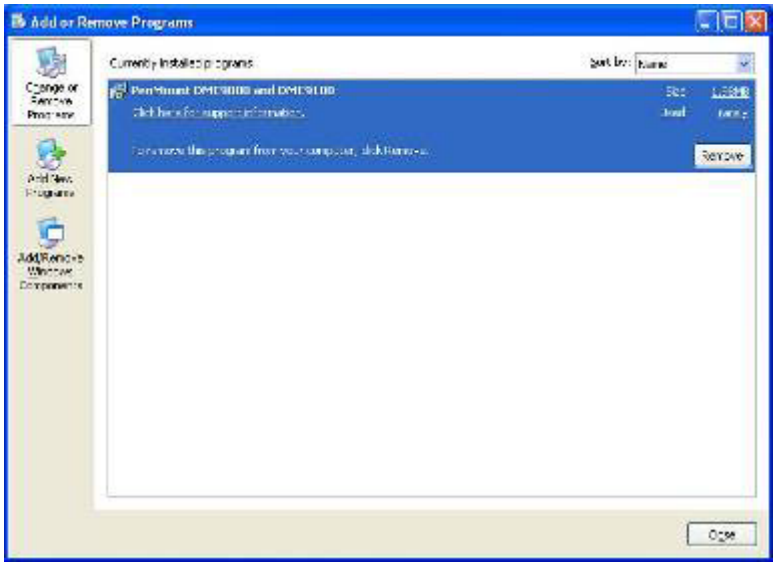
1. Install the rotation software package.
2. Choose the rotating function (0°, 90°, 180°, 270°) in the 3rd party software. The calibration screen appears automatically. Touch this point and rotation is mapped.



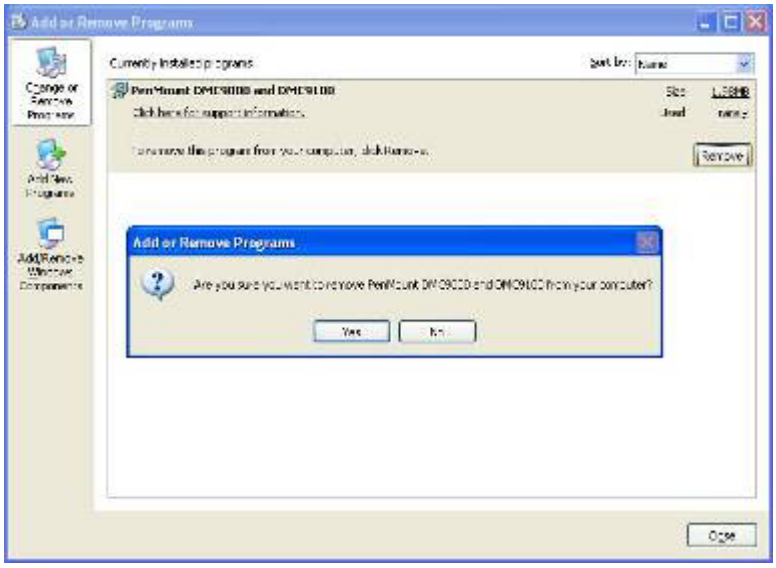
NOTE: The rotating function is disabled if you use Monitor Mapping

4.5 Uninstall the PenMount Windows 2000/XP Driver

1. Exit the PenMount monitor (PM) in the menu bar.
2. Go to **Settings**, then **Control Panel**, and then click **Add/Remove program**. Select **PenMount DMC9000** and click the **Add/Remove** button.



3. Select **PenMount DMC9000 and DMC9100**. Click the **Remove** button.



4. Select “Yes” and “Close” to remove the PenMount Windows 2000/XP driver, and reboot the system.

Chapter 5

5.1 Software Functions

This chapter describes the special software functions that configure and adjust the PenMount controller board and touch screen hardware. Please note that not all of the functions are available for every driver. Software functions and their availability for specific interface and systems are shown in the table below—a description for each function follows:

Software Function	DOS	Win 3.1	95	98/Me	NT	2000/XP	CE	Linux	QNX
Standard Calibration	●	●	●	●■	●	●■	●■	●■	●
Advanced Calibration				●■	●	●■	●■		
Multiple Monitors						●			
Multi Device				■		●■	■		
Rotation			●	●■	●	●■			
Stream/Point mode				●■		●■			
Drawing mode	●	●	●	●■	●	●■	●■		
Beep Sound	●	●	●	●■	●	●■		●■	●
Beep sound adjustable				●■		●■			
Wake up function				●■		■			
Showing linearity				●■		●■			
Right button		●	●	●■	●	●■	●■		●
Hide cursor	●	●	●		●				
Double click area and speed adjustable			●		●				
About		●	●	●■	●	●■			

● RS-232 Interface (9000 series)
■ USB Interface (5000 series)

5.2 Software Function Description

Description for each of the software functions shown in the table above follows:

Standard Calibration

The Standard Calibration function lets you match the touch screen to your display so that the point you touch is accurately tracked on screen. Standard calibration only requires four points for calibration and one point for confirmation. Under normal circumstances, Standard Calibration is all you need to perform an accurate calibration.

Advanced Calibration

The Advanced Calibration function improves the accuracy of calibration by using more involved engineering calculations. Use this function only if you have tried the Standard Calibration and there is still a discrepancy in the way the touch screen maps to the display. You can choose 4, 9, 16 or 25 points to calibrate, though we suggest that you first try 9 points, if it is still not tracking well then try 16 or 25 points. The more points you use for calibration, the greater the accuracy. Errors in calibration may occur due to viewing angle, or individual skill, and there may be little difference in using 16 or 25 points. Note that a stylus is recommended for the most accurate results.

Multiple Monitors

Until now most touch screen systems only support one monitor, and users of multiple monitors have not been able to use touch screen systems. This situation has inspired PenMount to design and develop Multiple Monitors support using the PenMount 9036 control board and Windows 2000/XP driver. Our advanced design supports from 2 to 6 monitors that can be split horizontally or vertically.

Requirements

Before using the Multiple Monitor function, you need the following:

1. A display card that supports multiple monitors such as the Matrox, nVidia, ATI, etc. (Two or more display cards supported by Windows are also OK.)
2. Two or more touch screens
3. Two or more serial ports
4. Two or more PenMount 9000 control boards such as the 9036, 9026, 9084, or 90A4
5. The PenMount 9000 Windows 2000/XP v4.01 or greater software driver

Before using Multiple Monitors you must have two or more monitors that are in extension mode. For display cards that support multiple monitors, we suggest you consider Matrox,

nVidia, or ATI cards and inquire about operation and usability issues.

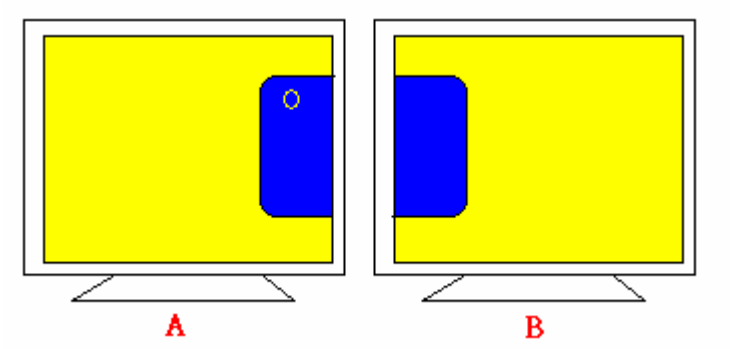
Note: Before you can use multiple monitors, you need to map each monitor.

Multiple Devices

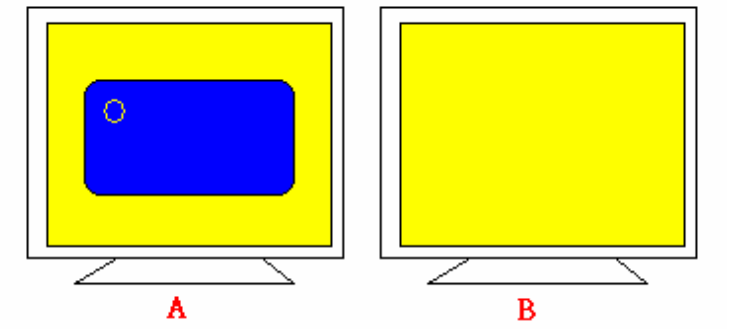
The Multiple Devices function is designed to let you use two or more monitors to display the same image. Software that supports this function includes the PenMount 9000 2000/XP drivers and the PenMount 5000 2000/XP/CE drivers. The drivers for PenMount 9000 can support up to six control boards, and the drivers for PenMount 5000 support up to 16

Comparing Functions

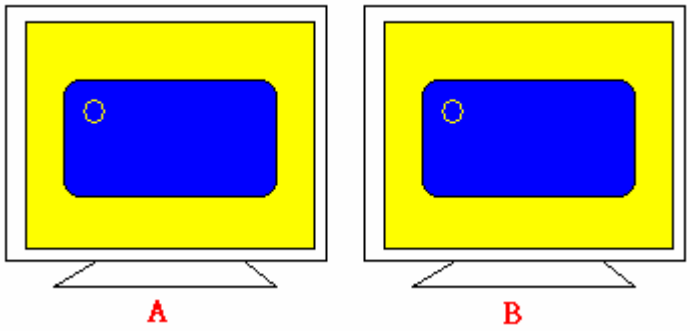
The difference between the Multiple Monitors function and the Multiple Devices function are illustrated below:



or



The Multiple Monitors function shown above extends the screen into 2 or more monitors.



The Multiple Devices function displays the same image on two or more monitors.

Requirements

Before using the Multiple Monitors function, you need the following:

1. A display card that supports Dual Monitors such as the Matrox, nVidia, ATI, etc., or that outputs into a 1-into-2 VGA signal box
2. Two or more touch screens
3. Two or more serial ports or USB ports
4. Two or more PenMount 9000 control boards such as the 9036, 9026, 9084, or 90A4, or PenMount 5000 control boards such as the 5184 or 51A5
5. If using the PenMount 9000 control board the driver must be the PenMount 9000 Windows 2000/XP v4.01 or greater software driver
6. If using the PenMount 5000 control board the driver must be for Windows /2000/XP/CE

9000 Control Boards

To use multiple devices with 9000 Control Boards:

1. Configure your computer hardware.
2. Attach each 9000 Control Board to a different computer's serial port.
3. Install the appropriate PenMount software driver in each computer.
4. Use each driver's Calibration function to calibrate each computer's touch screen. You must calibrate each touch screen before configuration is complete.

Rotation

There are currently a number of software packages on the market that support rotating monitors 0°, 90°, 180°, and 270°. However, you will not be able to use a touch screen unless it is matched to the appropriate rotation. Our rotation configuration function allows you to easily match the touch screen when you rotate your monitor.

If you use a rotating monitor, you will need a display card such as from nVidia, Intel, SMI or ATI and software such as Portrait Pivot Pro. For software operation and features, please refer to your software manual.

Configuring the rotation function is easy. Select this option and a 'point' appears for you

to touch. Once the point is touched, the software driver understands which degree you plan to rotate your display. The rotation function supports 90, 180 and 270 degrees rotation.

0 degrees

90 degrees

180 degrees

270 degrees

Stream/Point Mode

Stream and point modes control the touch and drag function of the touch screen. The point mode only allows “touch” interaction with the screen and does not allow the user to drag objects. The point mode is useful for maintaining the location of screen icons such on POS terminals. The stream mode allows a user to touch and drag icons and other items around on the screen, similar to using a mouse.

Drawing Mode

Drawing mode is a utility that lets the user draw on the screen using a finger or stylus. This allows the user to test the touch screen and touch controller to see if it is operational or is mapped correctly. The drawing mode can display either the matrix address of points touched or just show lines drawn. One of the PenMount driver’s strengths is a special mathematical algorithm that minimizes the occurrence of noise and smooths the drawing of lines.

Beep Sound

All of PenMount’s drivers support the beep sound function; however, some PC systems may only offer a fixed buzzer sound.

Beep Sound Adjustable

Software drivers for Windows systems let the user adjust the frequency and length of the beep sound. The drivers let the user adjust the desired touch screen sound, as well as turn the sound off.

Wake Up Function

The Wake Up function lets the user touch the screen and wake the system up from ‘suspend’ mode.

Point Calibration Data

The Plot Calibration Data function displays the touch screen linearity map, which is available if the PenMount driver provides an Advance Calibration function when touch screens age their touch linearity declines. This non-linearity is apparent when the touched point on the touch screen is not the same as the point on the display. The plot calibration data function shows the linearity status of the touch screen. This is only a support function for the user. The exact linearity of a touch screen requires a linearity test machine.

Right Button

The Right Button function simulates the right button function of a mouse. Click the right button and the user can only touch the screen once and the driver changes the touch definition to the left button.

Hide Cursor

The Hide Cursor function keeps the cursor arrow and other cursor symbols from appearing when using the touch screen. The cursor appears when the user turns this function off.

Cursor Offset

The Cursor Offset function lets the user adjust the position of the touch point to a desired location away from the real touch point.

Double-Click Area and Speed

The Double-Click Area and Speed function lets the user adjust the double-click area and speed to their personal preference.

About

This option shows the exact version of the drivers and controller firmware. Updated drivers are available for download on the PenMount website.